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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,999	08/21/2003	Chie Yoshida	0171-1013P	7099
2292	7590	06/03/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			HAILEY, PATRICIA L	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/644,999

Applicant(s)

YOSHIDA, CHIE

Examiner

Patricia L. Hailey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 08/21/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on August 21, 2003.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. ***Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.***

In claim 1, it cannot be readily determined what Applicants intend to claim as their invention. While the first line of claim 1 recites a "method of manufacturing gas diffusion electrodes", the last line of the claim recites "heating and drying the sheet". Claim 1 lacks specific recitation as to how the "gas diffusion electrodes" are actually obtained.

Claim 4 is indefinite for lacking antecedent basis for the word "web", i.e., "wherein heating and drying of the web is carried out using a continuous dryer". Claim 1, from which claim 4 depends, does not recite the word "web".

***Examiner's Interpretation of the Instant Claims***

In view of the aforementioned 112(2) rejection, the Examiner will envision the claimed invention as a method of manufacturing a sheet from a slurry containing solids composed of an

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electrically conductive powder, carbon fibers, organic fibers, and a resin. The slurry is assumed to contain additional components—solids, as well as liquids—not considered to compromise or deleteriously alter the claimed invention. The claims in their present form are not seen to be limited to “a gas diffusion electrode”, since the claims presently do not recite any steps or parameters in which an electrode is actually produced or obtained.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. ***Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (U. S. Patent No. 6,803,139).***

#### **Regarding claims 1 and 4:**

Saito et al. disclose a method for making a fuel cell separator that functions to efficiently diffuse the fuel gas and oxidizing agent gas into a fuel cell (column 8, lines 22-27), comprising:

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forming a resinous composition by admixing an electrically conductive carbon powder (component (A)) and a binding agent, wherein the binding agent is a mixture of a thermoplastic resin and a carbodiimide compound (see the Abstract, as well as col. 3, lines 1-5 of Saito et al.; considered to read upon component (D)). The admixture may additionally contain optional additives such as fibrous base material, examples of which include inorganic and organic fiber (components (B) and (C)), examples of which include carbon fiber. The fibrous base material may be present in amounts ranging from 0 to 100 parts by mass for 100 parts by mass of the thermoplastic resin. See col. 6, line 57 to col. 7, line 7 of Saito et al.

To prepare the resinous composition, the aforementioned components are either kneaded by melting, or "previously mixed in the usual way" prior to melt-kneading, optionally pelletized (then dried, if pelletization is performed), and molded under conditions to afford the separator to have grooves on one side or both sides thereof, said molding conditions including compression molding, belt pressing and roll molding. See col. 7, line 44 to col. 8, line 15 of Saito et al., which also discloses a mold temperature range of 20°C to 300°C ; these molding conditions are considered to read upon Applicants' claim limitations regarding the formation and heating of a sheet. Further, the temperature molding range is considered to encompass both the heating and the drying (i.e., continuous drying) of the aforementioned sheet.

***Regarding claim 2:***

The electrically conductive carbon powder has a mean particle diameter of 10 to 500  $\mu\text{m}$  (corresponding to a particle size of 20 to 1000  $\mu\text{m}$ , assuming the particle size is twice the diameter) and is present in amounts ranging from 100 to 1000 parts by mass per 100 parts by

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mass of the thermoplastic resin. See col. 3, lines 11-17 of Saito et al., as well as col. 6, lines 21-56.

***Regarding claim 5:***

The resinous composition serves as a fuel cell separator (col. 3, lines 18-25 of Saito et al.), having grooves on one side or both sides thereof, said grooves through which an oxidizing gas or fuel gas is supplied and discharged. See col. 3, lines 38-46 of Saito et al., which also discloses a polymer electrolyte fuel cell consisting of a plurality of fuel cells, each cell comprising a pair of electrodes holding therebetween an polymer electrolyte membrane, as well as a pair of fuel cell separators hereinabove described holding therebetween the electrodes. See also the Figures of Saito et al.

Further, the fuel cell separator of Saito et al. “functions to efficiently diffuse the fuel gas and oxidizing agent gas into the fuel cell. Therefore, it is flat and has extended, completely bent gas passages and through holes called manifold.” See col. 8, lines 22-27 of Saito et al.; this disclosure is considered to read upon the claim limitation “gas diffusion electrode”.

Although Saito et al. do not disclose the identical percentage ranges for the claimed components (A) through (D), these percentage ranges are considered clearly result-effective variables one of ordinary skill in the art would select based on availability, cost analysis, and optimal quality and functionality of the final product.

7. ***Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (U. S. Patent No. 6,803,139) in view of Saito et al. (U. S. Patent No. 6,686,083).***

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Saito et al. '139 are relied upon for its teachings in the above rejection of claims 1, 2, 4, and 5. While Saito et al. '139 disclose the employment of carbon fibers, this reference does not teach or suggest the length of these fibers, as recited in claim 3.

Saito et al. '083 disclose a carbonaceous composite material composed mainly of graphite (an electrically conductive powder), a thermosetting resin, and a fibrous base material, as well as a process for making said composite material. See col. 2, lines 25-64 of Saito et al. '083, as well as col. 3, line 47 to col. 4, line 10.

Examples of the fibrous base material include inorganic and organic fibers; carbon fibers are preferred (col. 4, lines 28-34), said fibers being of length ranging from about 1 to 20 mm (col. 4, lines 34 and 35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Saito et al. '139 by employing therein carbon fibers having a length ranging from 1 to 20 mm, as suggested by Saito et al. '083, to thereby obtain Applicants' claimed invention. Because both references teach comparable composite materials (in terms of components), as well as comparable methods of preparing said materials, motivation to combine the teachings of these references is considered proper.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



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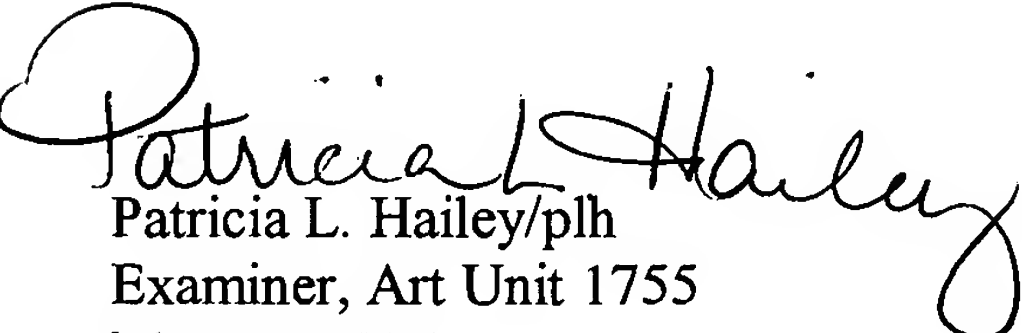
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369.

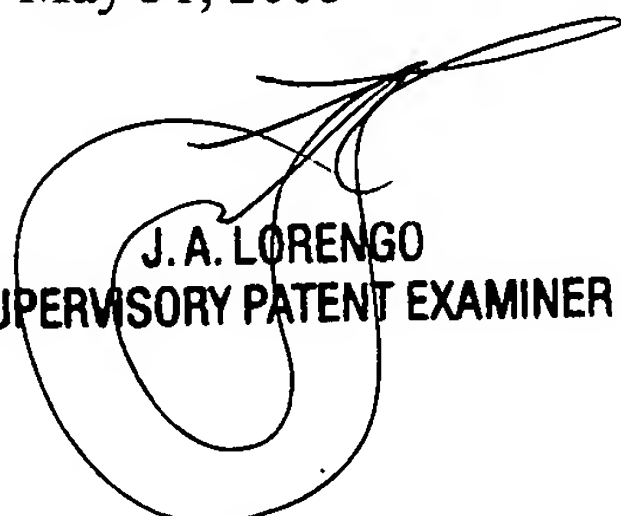
The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
May 31, 2005

  
J.A. LORENGO  
SUPERVISORY PATENT EXAMINER